## IN THE CLAIMS:

Please cancel claims 1-43 and add new claims 44-94 as follows:

Claims 1-43. (Canceled).

44. (New) A method of fabricating a track in a layer of thin film material for use in a superconducting coil, the layer provided on a former having a substantially curved surface, the method comprising the steps of:

scanning the layer to detect defects in the layer by probing a physical property of the material comprising the layer, without the coil path being defined in the layer, to provide a data set of the physical property;

processing the data set to form a map having features indicating variations in the physical property over the layer;

analyzing the features of the map to identify and locate defects in the layer;

for each of the defects, identifying whether the defect is irreparable;

calculating an optimal path, wherein the path avoids any irreparable defects; and

defining the optimal path in the layer to define the coil track.

45. (New) The method as claimed in claim 44, wherein the method further comprises the steps of:

for each of the defects, identifying whether the defect is a repairable defect; and

repairing each repairable defect.

46. (New) The method of fabricating a track as claimed in claim 44, wherein the step of calculating the optimal path includes calculating a plurality of different paths to optimize the performance of the coil track once defined in the layer and choosing the optimal path from the plurality of different paths.

47. (New) The method of fabricating a track as claimed in claim 46, wherein the step of calculating the optimal path includes choosing from the plurality of different paths another path as the optimal path, if an inhomogeneity develops in the calculation.

48. (New) The method of fabricating a track as claimed in claim 47, wherein the step of calculating the optimal path includes computing a path that avoids each weak area in the track that has an irreparable defect.

49. (New) The method of fabricating a track as claimed in claim 548 wherein the step of calculating the optimal path includes coupling other, non-weak, areas of the layer in series.

50. (New) The method as claimed in claim 44, wherein the step of calculating the coil path comprises the step of adapting the path of the coil track such that the coil track produces a magnetic field that is predetermined.

51. (New) The method as claimed in claim 50, wherein the step of adapting the coil path to rectify the shape of the field produced by the coil track also accounts for each field produced by each other existing coil track that comprises the coil.

52. (New) The method as claimed in claim 50, wherein the step of adapting the coil path to rectify the shape of the field produced by the coil track also accounts for each field external to the coil.

53. (New) The method as claimed in claim 44, further comprising the step of abandoning each part of the layer that has too many defects to be repairable or avoidable, or that would be easier to abandon than to repair or to avoid.

54. (New) The method as claimed claim 44, wherein the scanning step comprises a plurality of probing steps, a different physical property of the material being probed during each probing step, each different physical property having a data set processable to form a map.

55. (New) The method as claimed in claim 54, wherein each map is combined with one or more of the other maps to provide a composite map.

56. (New) The method as claimed in claim 55, wherein each map is weighted relative to each other map when combined to provide the composite map.

57. (New) The method as claimed in claim 44, wherein the layer is a thin film of super-conducting material, and the step of scanning further comprises a step of testing whether the coil track superconducts.

58. (New) The method as claimed in claim 57, wherein the step of testing uses a binary search method thereby locating a part of the coil track that does not have predetermined superconducting properties.

59. (New) The method as claimed in claim 58, wherein the binary search method uses contact brushes that are moved in an iterative procedure to locate the or each defective area.

60. (New) The method as claimed in claim 59, wherein the binary search method uses a probe to perturb the superconductive properties locally.

61. (New) The method as claimed in claim 60, wherein the step of testing uses a probe spot method thereby locating a part of the coil track that does not have predetermined superconducting properties.

62. (New) The method as claimed in claim 57, wherein the step of testing uses a dynamic testing technique locating a part of the coil track that is non-superconductive, the dynamic testing technique being dependent on at least one dynamic variable.

63. (New) The method as claimed in claim 62, wherein the at least one dynamic variable is a speed of rotation of the former divided by a probe repetition frequency.

64. (New) The method as claimed in claim 57, further comprising the step of producing a result from the step of testing indicating whether the coil track superconducts, the result being portrayed as a map of the coil track, the map indicating each part of the coil track that has poor superconducting properties, and a location of each part of the coil track that has poor superconducting properties.

65. (New) The method as claimed in claim 64, further comprising the step of abandoning a part of the coil track that has poor superconducting properties.

66. (New) The method as claimed in claim 65, further comprising the step of interconnecting those parts of the coil track that are not abandoned.

67. (New) The method as claimed in claim 64, further comprising the step of repairing a part of the track that has poor superconducting properties.

68. (New) The method as claimed in claim 44, wherein the layer is a buffer layer or a metallization layer.

69. (New) The method as claimed in claim 68, wherein the coil track is formed in a subsequent layer.

70. (New) The method as claimed in claim 44, wherein the former defines a substantially right circular cylindrical surface and the coil path defines a substantially spiral track about the former.

71. (New) The method as claimed in claim 44, wherein the step of defining the coil track includes writing or patterning a path in the layer.

72. (New) The method as claimed in claim 44, further comprising the step of depositing, shaping and texturing the material comprising the layer to form the track by defining the path, in situ, on, or in, the surface of the former.

73. (New) A computer-readable medium storing computer-executable instructions for performing the steps recited in claim 44.

74. (New) A device fabricated as a result of performing the method of claim 44.

75. (New) The method as claimed in claim 44, further including:

depositing, shaping and texturing the material comprising the layer; and

forming the coil track.

76. (New) Apparatus for fabricating a track, the track being formed in a layer of thin film material for use in a superconducting coil, the layer provided on a former having a substantially curved surface, the track thereby being defined by a path being defined into or onto the layer, the apparatus comprising:

a scanner for scanning the layer to detect defects in the layer, the scanner comprising a probe for probing a physical characteristic of the material comprising the layer, the probe being arranged to transmit a signal comprising a data set of the physical property;

a memory for storing data;

a processor connected to the memory and the scanner, the processor being configured to:

control the probe and to receive the signal transmitted by the probe,

process the signal, thereby extracting the data set,

process the data set to form a map having features indicating variations in the physical property over the layer,

analyze the features of the map to identify and locate each defect in the layer

identify each defect that is irreparable,

calculate an optimal coil path, wherein the path avoids any irreparable defects, and

direct the data set and the map to the memory for storage; and

a coil writer connected to the processor, the processor being configured to control the coil writer to define the optimal coil path into or onto the layer, thereby defining the coil track.

77. (New) The apparatus as claimed in claim 76, further comprising a repairer, the repairer being connected to the processor, the processor being configured to identify those defects that are repairable and to control the repairer to repair the reparable defects.

78. (New) The apparatus as claimed in claim 76, wherein the processor is further configured to:

calculate the optimal path in order to abandon each part of the layer having too many defects to be repairable or avoidable, or each part that would be more easily abandoned than repaired or avoided; and

control the coil writer to interconnect those parts of the layer not abandoned.

79. (New) The apparatus as claimed claim 76, wherein the processor is further configured to adapt the calculation of the optimal path such that the coil track produces a magnetic field that is predetermined.

80. (New) The apparatus as claimed in claim 76, the layer being a thin film of superconducting material, the scanner comprising a coil tester, the processor connected to the coil tester and being configured to control the coil tester, wherein the processor controls the coil tester to locate weakly superconducting areas of the coil track by using a probe test or an electrical test or a combination of both, and wherein the processor calculates the optimal path in order to abandon a part of the coil that has poor superconducting properties.

81. (New) The apparatus as claimed in claim 76, wherein the scanner comprises a plurality of probes, each probe configured to detect a different physical property of the material and create a different data set, and the scanner transmits the data set to the processor, and wherein the processor is further configured to process each data set to form a map of the variations of the corresponding material properties of the layer and to combine one or more of the maps of different physical properties to provide a composite map.

82. (New) The apparatus as claimed in claim 76, wherein the layer is a buffer layer or a metallization layer.

83. (New) The apparatus as claimed in claim 76, further including a deposition device being arranged to deposit, shape and texture the layer, in situ, on the surface of the former, wherein the apparatus is further arranged to form the track.

84. (New) A method of fabricating a track in a layer of thin film material for use in a superconducting coil, the layer provided on a former having a substantially curved surface, the method comprising the steps of:

scanning the layer to detect defects in the layer by probing a physical property of the material comprising the layer, before the coil path is defined in the layer, to provide a data set of the physical property;

processing the data set to form a map, the map having features indicating variations in the physical property over the layer;

analyzing the features of the map to identify and locate defects in the layer;

for each of the defects, identifying whether the defect is irreparable;

calculating a number of coil paths so as to avoid the irreparable defect(s);

choosing one of the coil paths as an optimal path; and

forming the optimal path in the layer to define the coil track.

85. (New) A method of fabricating a track in a layer of thin film material for use in a superconducting coil, the layer provided on a former having a substantially curved surface, the method comprising the steps of:

scanning the layer to detect variations of a physical property in the layer by probing the physical property of the material comprising the layer, before the coil path is defined in the layer, to provide a data set of the physical property;

processing the data set to identify and locate variations of the physical property in the layer;

choosing an optimal path based on the variations in the physical property; and

defining the optimal path in the layer to define the coil track.

86. (New) The method as claimed in claim 85, wherein a defect in the layer is indicated by the variations in the physical property in the layer, and wherein the method further comprises the steps of:

identifying whether each defect is a repairable defect; and

repairing each repairable defect.

87. (New) The method as claimed in claim 85, wherein the step of choosing the optimal path includes the step of calculating the optimal path.

88. (New) The method as claimed in claim 85, wherein a defect in the layer is indicated by the variations in the physical property in the layer, and the step of choosing the optimal path includes avoiding any defect.

90. (New) The method as claimed in claim 85, wherein the processing step includes the steps of:

forming a map having features indicating the variations in the physical properties over the layer; and

analyzing the features of the map to identify and locate defects in the layer, wherein a defect in the layer is indicated by variations in the physical property in the layer.

91. (New) An apparatus for fabricating a track, the track being formed in a layer of thin film material for use in a superconducting coil, the layer provided on a former having a substantially curved surface, the track thereby being defined by a path being defined into or onto the layer, the apparatus comprising:

a scanner for scanning the layer to detect variations of a physical property in the layer, the scanner comprising a probe for probing the physical property of the material comprising the layer, the probe being configured to transmit a signal comprising a data set of the physical property;

a memory for storing data;

a processor connected to the memory and the scanner, the processor being configured to:

control the probe and receive the signal transmitted by the probe,

process the signal, thereby extracting the data set,

process the data set to identify and locate the variations of the physical property in the layer,

choose an optimal coil path based on the detected variations in the physical property, and

direct the data set and the map to the memory for storage; and

a coil writer connected to the processor, the processor being configured to control the coil writer to define the optimal coil path into or onto the layer, thereby defining the coil track.

92. (New) The apparatus as claimed in claim 91, wherein a defect in the layer is indicated by variations in the physical property in the layer, and in processing the data set the processor is further configured to:

form a map having features indicating variations in the physical property over the layer; and

analyze the features of the map to identify and locate each defect in the layer.

93. (New) The apparatus as claimed in claim 91, wherein in choosing the optimal coil path the processor is configured to calculate the optimal coil path.

94. (New) Apparatus as claimed in claim 91, wherein a defect in the layer is indicated by the variations in the physical property in the layer, and in choosing the optimal coil path the processor is configured to avoid any defect.